

We claim:

- 5 1. A method for promoting survival and/or functional performance of neuronal cells susceptible to exotoxicity, comprising contacting the cells with an amount of a lipophilic modified *hedgehog* polypeptide effective to reduce exotoxin-mediated degradation of the cells.
- 10 2. A method for promoting survival of substantia nigra neuronal cells comprising contacting the cells with a trophic amount of a lipophilic modified *hedgehog* polypeptide.
3. A method for promoting survival of dopaminergic cells comprising contacting the cells with a trophic amount of a lipophilic modified *hedgehog* polypeptide.
- 15 4. A method for promoting survival of GABAergic cells comprising contacting the cells with a trophic amount of a lipophilic modified *hedgehog* polypeptide or a lipophilic modified *hedgehog* polypeptide.
5. A method for the treating a disorder characterized by loss of dopaminergic and/or GABAergic neurons which comprises administering to a patient in need thereof a therapeutically effective amount of lipophilic modified *hedgehog* polypeptide.
- 20 6. A method for the treating or preventing Parkinson's disease comprising administering to a patient in need thereof a therapeutically effective amount of lipophilic modified *hedgehog* polypeptide.
7. A method for the treating or preventing Huntington's disease comprising administering to a patient in need thereof a therapeutically effective amount of lipophilic modified *hedgehog* polypeptide.
- 25 8. A method for treatment or prophylaxis of a disorder selected from the group consisting of
domoic acid poisoning; spinal cord trauma; hypoglycemia; mechanical trauma
to the nervous system; senile dementia; Korsakoff's disease; schizophrenia;
30 AIDS dementia, multi-infarct dementia; mood disorders; depression; chemical toxicity; neuronal damage associated with uncontrolled seizures, such as epileptic seizures; neuronal injury associated with HIV and AIDS; neurodegeneration associated with Down's syndrome; neuropathic pain syndrome; olivopontocerebral atrophy; amyotrophic lateral sclerosis; mitochondrial abnormalities; Alzheimer's disease; hepatic encephalopathy;
35 Tourette's syndrome; schizophrenia; and drug addiction,

comprising administering to a patient in need thereof a therapeutically effective amount of lipophilic modified *hedgehog* polypeptide.

- 5 9. The method of any of claims 1-8, wherein the *hedgehog* polypeptide is modified with one or more sterol moieties.
10. The method of claim 9, wherein the sterol moiety is cholesterol.
11. The method of any of claims 1-8, wherein the *hedgehog* polypeptide is modified with one or more fatty acid moieties.
- 10 12. The method of claim 11, wherein each fatty acid moiety is independently selected from the group consisting of myristoyl, palmitoyl, stearoyl, and arachidoyl.
13. The method of any of claims 1-8, wherein the *hedgehog* polypeptide is modified with one or more aromatic hydrocarbons.
- 15 14. The method of claim 13, wherein each aromatic hydrocarbon is independently selected from the group consisting of benzene, perylene, phenanthrene, anthracene, naphthalene, pyrene, chrysene, and naphthacene.
15. The method of any of claims 1-8, wherein the *hedgehog* polypeptide is modified one or more times with a C7 - C30 alkyl or cycloalkyl.
16. The method of any of claims 5-8, wherein patient is being treated prophylactically.
- 20 17. A therapeutic preparation of a lipophilic modified *hedgehog* polypeptide provided in a pharmaceutically acceptable carrier and in an amount sufficient to promote survival of dopaminergic cells in a mammal.
18. The preparation of claim 17, wherein the lipophilic modified *hedgehog* polypeptide is provided in an amount sufficient to produce sufficient to promote survival of dopaminergic cells in a mammal treated with MPTP at 1mg/kg.
- 25 19. The preparation of claim 18, wherein the *patched* antagonist is provided in an amount sufficient to produce sufficient to promote survival of dopaminergic cells in a mammal treated with MPTP at 10mg/kg.
20. A method for limiting damage to neuronal cells by Parkinsonian conditions, comprising administering to a patient a lipophilic modified *hedgehog* polypeptide.
- 30 21. A therapeutic preparation of a lipophilic modified *hedgehog* polypeptide provided in a pharmaceutically acceptable carrier and in an amount sufficient to promote survival of, or enhance functional performance of exotoxin-sensitive neuronal cells in a mammal.